

Tracking Climate & Ecological Changes in India

A Power BI dashboard analysing temperature trends, CO₂ emissions, deforestation, and natural disaster impacts from 1960 to 2020.

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Table of Contents

1. Project Overview
2. Objectives
3. Data Sources
4. Dashboard Summary
5. Key Visuals & Insights
6. Skills & Tools Used
7. Business Impact / Value
8. Conclusion

Project Overview

This Power BI dashboard analyses climate and ecological trends in India from 1960 to 2020, focusing on key environmental indicators such as temperature changes, CO₂ emissions, deforestation, and natural disaster impacts.

The data used for this project was sourced from publicly available datasets on Kaggle and GitHub, covering historical records compiled from institutions like the World Bank, FAO, and EM-DAT. The dashboard integrates these datasets into a unified, interactive report to reveal long-term environmental patterns.

This project demonstrates core Business Analyst skills — including data cleaning, transformation, visualization, and KPI reporting — using Power BI, Power Query, and DAX.

Objectives

1. To track and visualize changes in India's climate indicators, including temperature trends and CO₂ emissions, from 1960 to 2020.
2. To analyse sector-wise CO₂ emission contributions and their growth over time.
3. To assess the extent of deforestation in India between 1990 and 2020 using clear, comparative visuals.
4. To present the human impact of natural disasters through historical death count data.
5. To build an interactive Power BI dashboard that simplifies complex environmental data for easier understanding and decision-making.
6. To demonstrate data analysis, visualization, and storytelling skills relevant to a Business Analyst role.

Data Sources

The data used for this Power BI project was collected from publicly available sources on Kaggle and GitHub. Each dataset was chosen to support specific environmental indicators relevant to India's climate and ecological changes.

- **Summary of Datasets Used**

Dataset	Source	Description
CO ₂ Emissions	GitHub	Annual CO ₂ emission data for India, used to analyse overall and sector-wise emissions.
Deforestation Data	Kaggle	Records of forest area loss in India, used to visualize deforestation trends.
Natural Disasters in India	Kaggle	Data on deaths caused by various natural disasters across different years.
Global Temperature Data	GitHub	Temperature anomaly data used to track long-term climate trends.

Notes:

- All datasets were cleaned and transformed using Power Query in Power BI.
- Relationships were built using the year field as a common key.
- Data was used to create interactive visuals, summary KPIs, and trend analysis charts.

Dashboard Summary

This Power BI dashboard analyses climate and environmental trends in India from 1960 to 2020. It highlights key indicators such as temperature change, CO₂ emissions, deforestation, and disaster-related deaths. Users can explore insights like rising CO₂ levels (from 18K to 720K), a 31% increase in temperature anomalies, and over 68K disaster-related deaths.

Visuals include line charts, KPI cards, donut charts, and interactive slicers. The dashboard is fully dynamic, allowing stakeholders to filter by year and category. This project demonstrates practical skills in data cleaning, transformation (Power Query), and DAX calculations, and presents complex data in a clear, decision-supporting format.

Key Visuals & Insights

Temperature change is represented using a KPI card and a line chart. The average temperature anomaly increased to 0.69°C, reflecting a 31.5% rise over the historical baseline. The line chart shows a steady upward trend from 1960 to 2020.

Deforestation trends are visualized through a bar chart and a KPI card. Forest area loss rose from 64,000 hectares in 1990 to 72,000 hectares in 2020, showing a clear increase in deforestation over the decades.

CO₂ emission trends are displayed using a line chart. Emissions increased significantly from 18,000 in 1960 to 720,000 in 2020, indicating rapid industrialization and energy use.

A donut chart presents the breakdown of CO₂ emissions by category. Gas fuel accounts for 69% of emissions, followed by liquid fuel at 26% and solid fuel at 4%.

Natural disaster impacts are shown through a bar chart and a KPI card. More than 68,000 deaths were recorded due to events such as floods, storms, earthquakes, and landslides, with spikes in specific years.

Interactivity is enabled through slicers for year. All visuals and KPIs update automatically based on user selections, allowing for dynamic and focused analysis.

Skills & Tools Used

Skills

Tools

Data cleaning and transformation	Power BI Desktop
Data modelling	Power Query
DAX calculations	DAX
Interactive dashboard design	Excel
Visual storytelling	Kaggle and GitHub (data sources)
Trend and KPI analysis	

Business Impact / Value

- Enables data-driven decision making about environmental policy, helping stakeholders move beyond opinion to evidence.
- Highlights long-term trends in climate change (temperature rise, CO₂ emissions), deforestation, and disaster losses, which can inform policy planning and prioritized interventions.
- Increases awareness of disaster risks by visualizing historical death counts, helping to shape disaster preparedness or emergency response resource allocation.
- Supports resource optimization: by identifying the most impactful sectors for CO₂ emissions (e.g. gas fuel), decision-makers can target mitigation efforts more efficiently.
- Reduces time spent on data aggregation and reporting; provides an “at-a-glance” view of multiple environmental indicators, rather than manual workbook analysis.

- Improves stakeholder communication and alignment: visuals make it easier for non-technical users to understand and discuss complex climate data.
- Lays groundwork for forecasting, monitoring, and future improvements (e.g. regional breakdowns, real-time updates), increasing long-term value and scalability.

Conclusion

This Power BI dashboard effectively consolidates six decades of environmental data to illuminate India's climate trends, deforestation, CO₂ emissions, and the human impact of natural disasters. By integrating interactive visuals, clear KPIs, and dynamic filtering, it transforms raw data into meaningful insights that support informed decision-making. The project also showcases capabilities in data transformation, modelling, and storytelling using Power BI, Power Query, and DAX. Ultimately, this dashboard serves both as a communication tool for policymakers and as a strong demonstration of analytical and data visualization competencies.